



# Adafruit Resistor Helper

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## TOOLS:

- [Craft knife \(1\)](#)
- [Cutting mat \(1\)](#)
- [Ruler \(1\)](#)
- [Scissors \(1\)](#)
- [Wire cutters/pliers \(1\)](#)



## PARTS:

- [4 paper fasteners \(1\)](#)

## SUMMARY

Papercrafts at Adafruit! We're excited to share this Resistor Helper you can download and make yourself. It's the newest tool in our [Circuit Playground](#) family— when you can't get to your iPhone or iPad, use paper! One side helps you read 4-band types and the other side takes care of 5-band types. The Resistor Helper is on [Thingiverse as a PDF](#) (with Illustrator editability preserved). Designed by Adafruit with [Matthew Borgatti](#). You can also grab the [PDF on github](#).

## Step 1 — Adafruit Resistor Helper



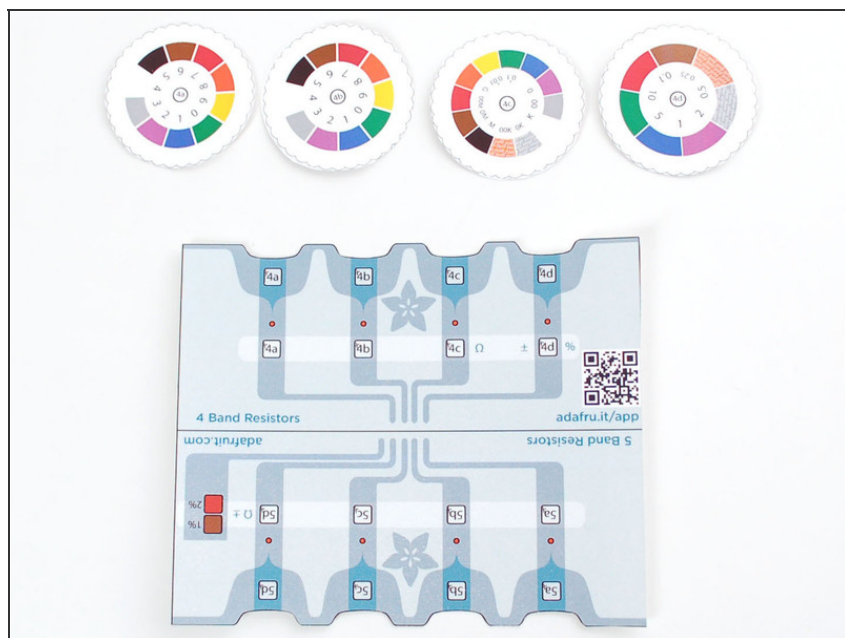
- Print out your Resistor Helper in color. It's sized to fit on one 8.5" x 11" sheet.
- The wheels are paired with small arrows. Cut around the holder and separate your wheel pairs from each other.

## Step 2



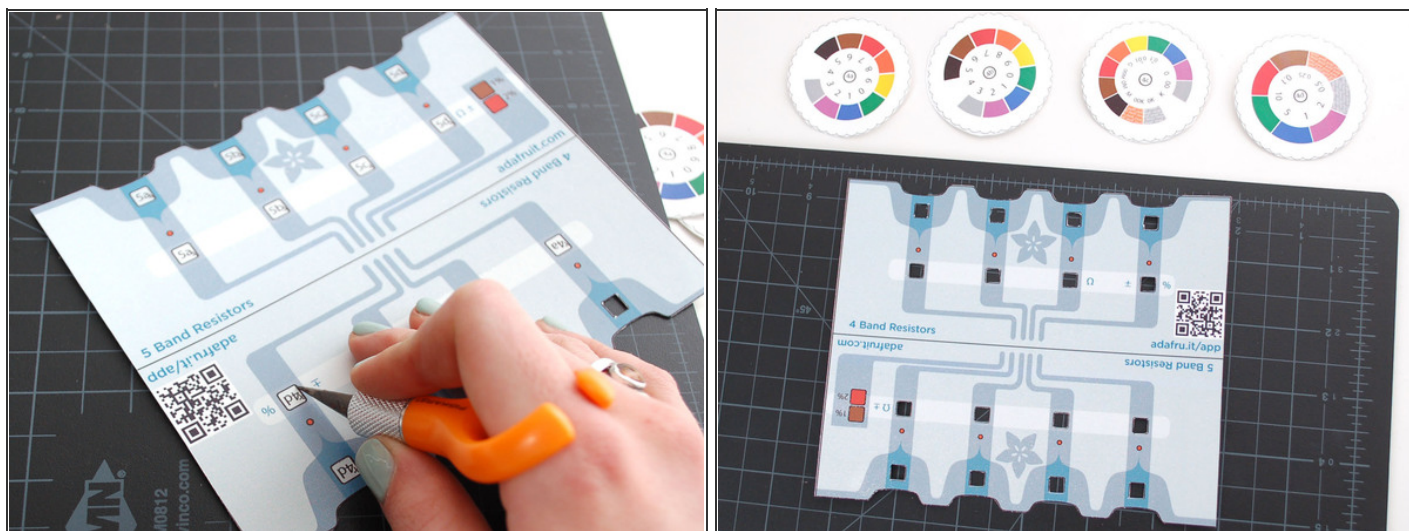
- Cut out and glue pairs of colored wheels back to back.
- Liquid glue can make the paper curl a bit, so we recommend drying the wheels under a heavy book (or warm laptop) for about an hour. Or you can use a glue stick!

### Step 3



- Line up your colored wheels by the letters and numbers – 4a is the first wheel on the 4-band side, for example. Keep track of your pieces because we're about to cut out the ID numbers!

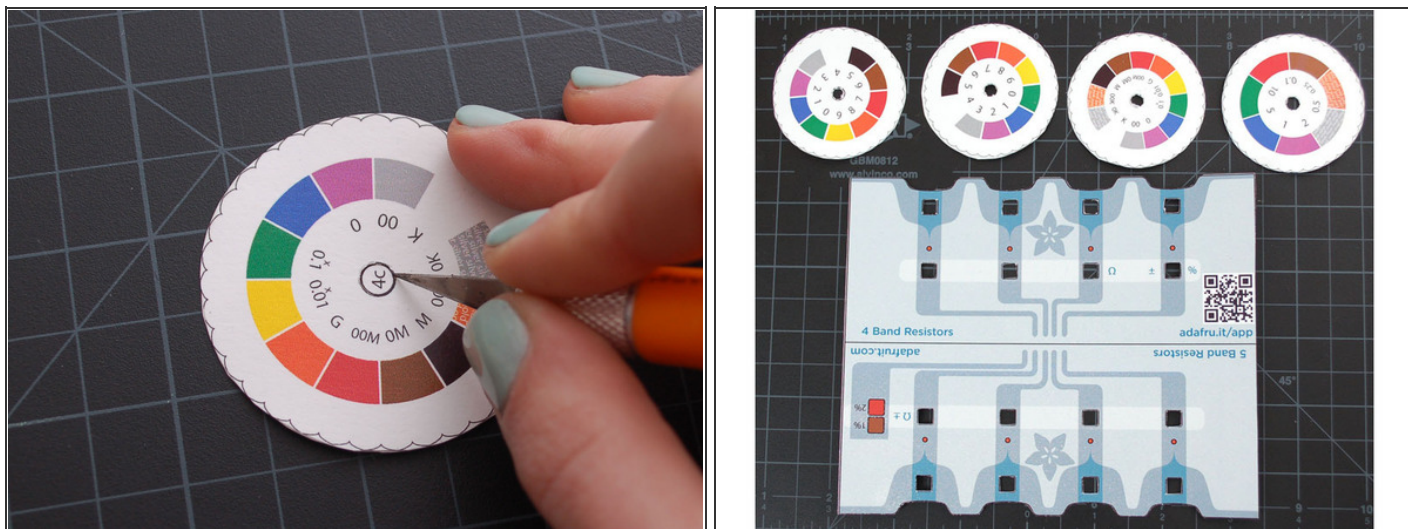
### Step 4



- Use a craft knife to carefully cut out the viewing windows in the holder.
- Double check your windowed holder against your row of wheels so you still remember where they go.

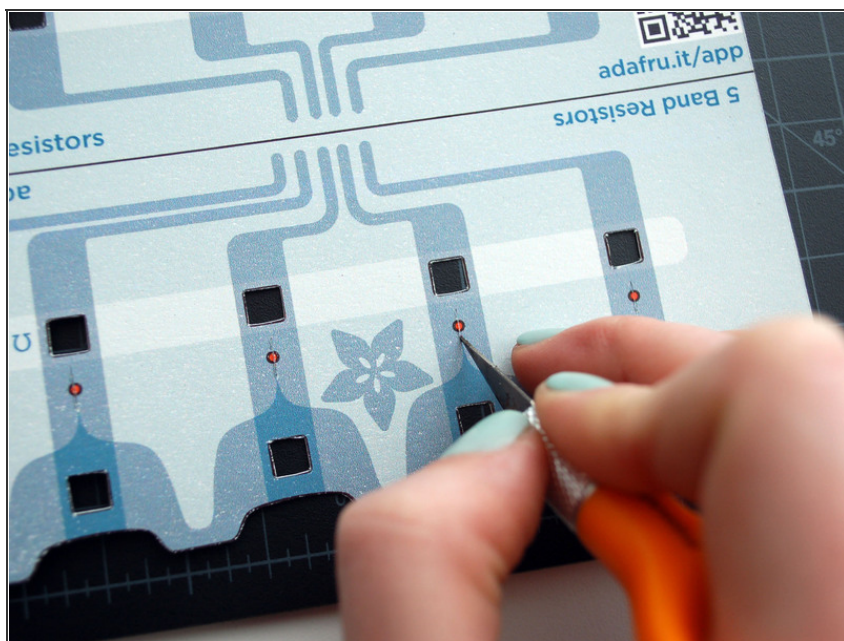


## Step 5



- Now carefully cut out the inner circles on your wheels, placing each one back in line before cutting the next one.
- Of course you can always refer back to this page if you forget which wheel is which!

## Step 6



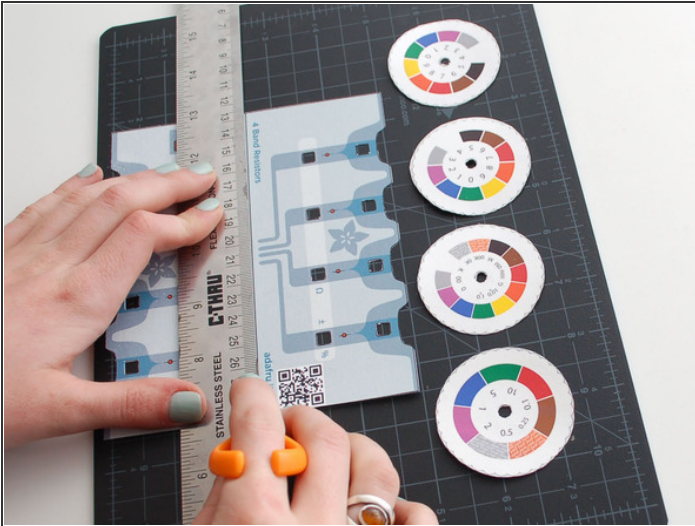
- Cut small slits over the red dots on the holder (both sides = 8 cuts). This is where the paper fasteners will anchor each wheel.

## Step 7



- Shorten the tabs on four paper fasteners with a pair of clippers.
- This is optional but we think it looks nicer!

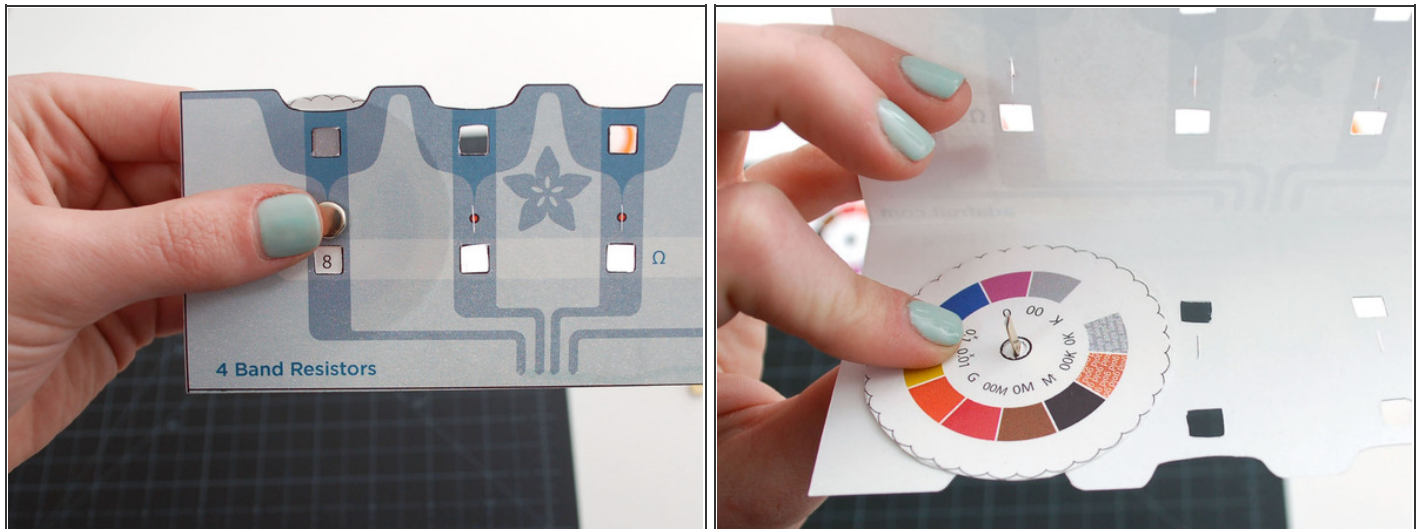
## Step 8



- Use a ruler to gently score (but not cut!) the fold line on the holder.
- The holder folds easily and neatly after scoring.

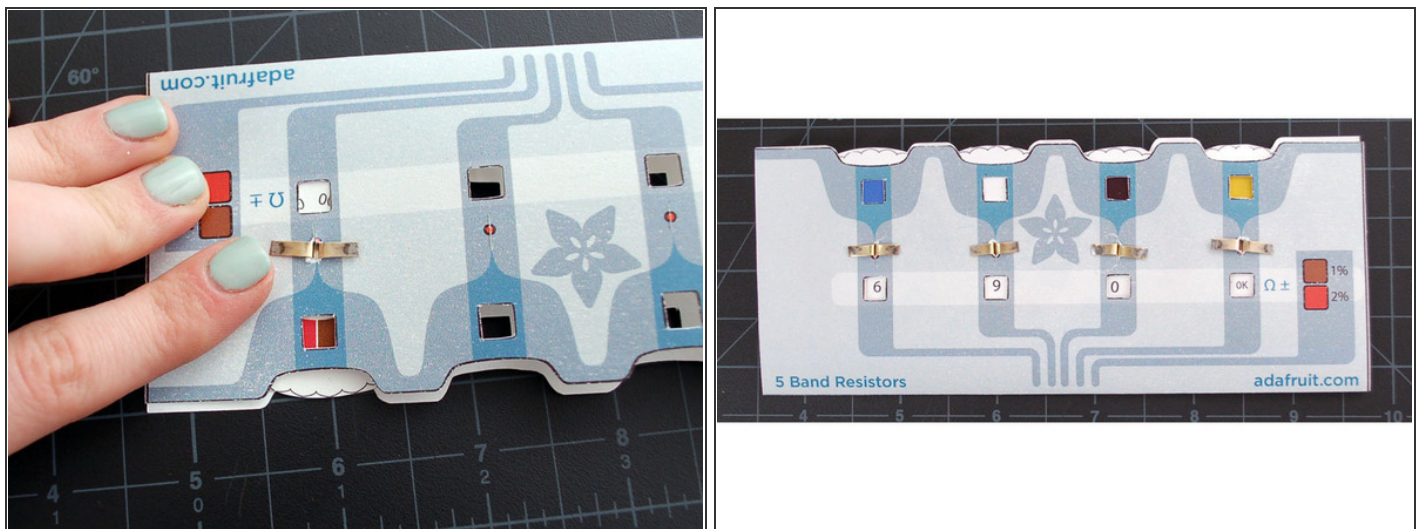


## Step 9



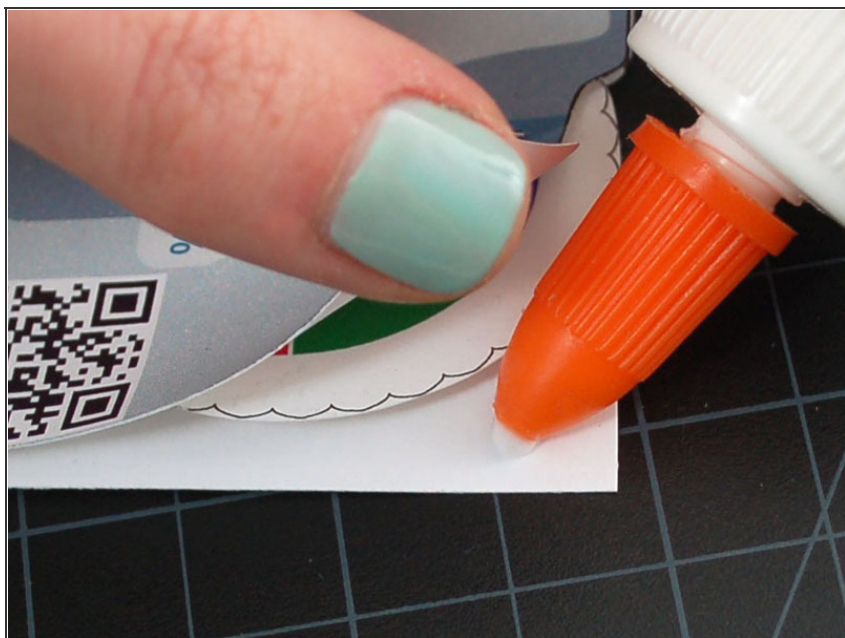
- Pierce a paper fastener through a tab on one side of the holder and through a wheel.
- You can assemble the Resistor Helper with either side as the “front,” but we think you’ll use the 4-band side more often.

## Step 10



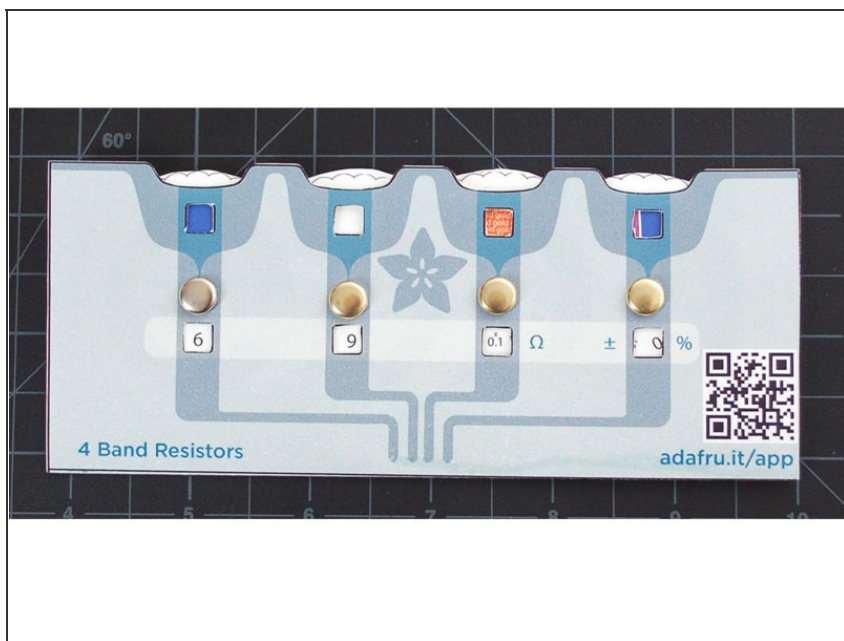
- Pierce through the opposite side of the holder and flare out the tabs on the fastener to secure.
- Repeat with the other three wheels.

## Step 11



- Once you've verified you assembled the wheels in the right order, carefully glue together the corners/edges of the holder.

## Step 12



- That's it! Use and enjoy!

This tutorial also appears on [Adafruit](#) and [Instructables](#).

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